

```
#1
```

```
<110> Strathmann AG & Co.
<120> Virus-Vaccine
<130> P057760
<140>
<141>
<150> 199 07 485.2
<151> 1999-02-12
<160> 12
<170> PatentIn Ver. 2.1
<210> 1
<211> 9709
<212> DNA
<213> Human immunodeficiency virus
<400> 1
```

tggaagggct aatttggtcc caaaaaagac aagagatcct tgatctgtgg atctaccaca 60 cacaaggcta cttccctgat tggcagaact acacaccagg gccagggatc agatatccac 120 tgacctttgg atggtgcttc aagttagtac cagttgaacc agagcaagta gaagaggcca 180 aataaggaga gaagaacagc ttgttacacc ctatgagcca gcatgggatg gaggacccgg 240 agggagaagt attagtgtgg aagtttgaca gcctcctagc atttcgtcac atggcccgag 300 agctgcatcc ggagtactac aaagactgct gacatcgagc tttctacaag ggactttccg 360 ctggggactt tccagggagg tgtggcctgg gcgggactgg ggagtggcga gccctcagat 420 gctacatata agcagctgct ttttgcctgt actgggtctc tctggttaga ccagatctga 480 gcctgggagc tctctggcta actagggaac ccactgctta agcctcaata aagcttgcct 540 tgagtgctca aagtagtgtg tgcccgtctg ttgtgtgact ctggtaacta gagatccctc 600 agaccetttt agteagtgtg gaaaatetet ageagtggeg eeegaacagg gaettgaaag 660 cgaaagtaaa gccagaggag atctctcgac gcaggactcg gcttgctgaa gcgcgcacgg 720 caagaggcga ggggcggcga ctggtgagta cgccaaaaat tttgactagc ggaggctaga 780 aggagagaga tgggtgcgag agcgtcggta ttaagcgggg gagaattaga taaatgggaa 840 aaaattcggt taaggccagg gggaaagaaa caatataaac taaaacatat agtatgggca 900 agcagggagc tagaacgatt cgcagttaat cctggccttt tagagacatc agaaggctgt 960 agacaaatac tgggacagct acaaccatcc cttcagacag gatcagaaga acttagatca 1020 ttatataata caatagcagt cctctattgt gtgcatcaaa ggatagatgt aaaagacacc 1080 gcagcagctg acacaggaaa caacagccag gtcagccaaa attaccctat agtgcagaac 1200 ctccaggggc aaatggtaca tcaggccata tcacctagaa ctttaaatgc atgggtaaaa 1260 gtagtagaag agaaggettt cageecagaa gtaataeeca tgtttteage attateagaa 1320 ggagccaccc cacaagattt aaataccatg ctaaacacag tggggggaca tcaagcagcc 1380 atgcaaatgt taaaagagac catcaatgag gaagctgcag aatgggatag attgcatcca 1440 gtgcatgcag ggcctattgc accaggccag atgagagaac caaggggaag tgacatagca 1500 ggaactacta gtaccettca ggaacaaata ggatggatga cacataatce acetateeca 1560 gtaggagaaa tctataaaag atggataatc ctgggattaa ataaaatagt aagaatgtat 1620 agccctacca gcattctgga cataagacaa ggaccaaagg aaccctttag agactatgta 1680 gaccgattct ataaaactct aagagccgag caagcttcac aagaggtaaa aaattggatg 1740 acagaaacct tgttggtcca aaatgcgaac ccagattgta agactatttt aaaagcattg 1800 ggaccaggag cgacactaga agaaatgatg acagcatgtc agggagtggg gggacccggc 1860 cataaagcaa gagttttggc tgaagcaatg agccaagtaa caaatccagc taccataatg 1920

atacagaaag gcaattttag gaaccaaaga aagactgtta agtgtttcaa ttgtggcaaa 1980 gaagggcaca tagccaaaaa ttgcagggcc cctaggaaaa agggctgttg gaaatgtgga 2040 aaggaaggac accaaatgaa agattgtact gagagacagg ctaatttttt agggaagatc 2100 tggccttccc acaagggaag gccagggaat tttcttcaga gcagaccaga gccaacagcc 2160 ccaccagaag agagetteag gtttggggaa gagacaacaa etecetetea gaageaggag 2220 ccgatagaca aggaactgta tcctttagct tccctcagat cactctttgg cagcgacccc 2280 tcgtcacaat aaagataggg gggcaattaa aggaagctct attagataca ggagcagatg 2340 atacagtatt agaagaaatg aatttgccag gaagatggaa accaaaaatg atagggggaa 2400 ttggaggttt tatcaaagta ggacagtatg atcagatact catagaaatc tgcggacata 2460 aagctatagg tacagtatta gtaggaccta cacctgtcaa cataattgga agaaatctgt 2520 tgactcagat tggctgcact ttaaattttc ccattagtcc tattgagact gtaccagtaa 2580 aattaaagcc aggaatggat ggcccaaaag ttaaacaatg gccattgaca gaagaaaaaa 2640 taaaagcatt agtagaaatt tgtacagaaa tggaaaagga aggaaaaatt tcaaaaattg 2700 ggcctgaaaa tccatacaat actccagtat ttgccataaa gaaaaaagac agtactaaat 2760 ggagaaaatt agtagatttc agagaactta ataagagaac tcaagatttc tgggaagttc 2820 aattaggaat accacatcct gcagggttaa aacagaaaaa atcagtaaca gtactggatg 2880 tgggcgatgc atatttttca gttcccttag ataaagactt caggaagtat actgcattta 2940 ccatacctag tataaacaat gagacaccag ggattagata tcagtacaat gtgcttccac 3000 agggatggaa aggatcacca gcaatattcc agtgtagcat gacaaaaatc ttagagcctt 3060 ttagaaaaca aaatccagac atagtcatct atcaatacat ggatgatttg tatgtaggat 3120 ctgacttaga aatagggcag catagaacaa aaatagagga actgagacaa catctgttga 3180 ggtggggatt taccacacca gacaaaaaac atcagaaaga acctccattc ctttggatgg 3240 gttatgaact ccatcctgat aaatggacag tacagcctat agtgctgcca gaaaaggaca 3300 gctggactgt caatgacata cagaaattag tgggaaaatt gaattgggca agtcagattt 3360 atgcagggat taaagtaagg caattatgta aacttcttag gggaaccaaa gcactaacag 3420 aagtagtacc actaacagaa gaagcagagc tagaactggc agaaaacagg gagattctaa 3480 aagaaccggt acatggagtg tattatgacc catcaaaaga cttaatagca gaaatacaga 3540 agcaggggca aggccaatgg acatatcaaa tttatcaaga gccatttaaa aatctgaaaa 3600 caggaaaata tgcaagaatg aagggtgccc acactaatga tgtgaaacaa ttaacagagg 3660 cagtacaaaa aatagccaca gaaagcatag taatatgggg aaagactcct aaatttaaat 3720 tacccataca aaaggaaaca tgggaagcat ggtggacaga gtattggcaa gccacctgga 3780 ttcctgagtg ggagtttgtc aatacccctc ccttagtgaa gttatggtac cagttagaga 3840 aagaacccat aataggagca gaaactttct atgtagatgg ggcagccaat agggaaacta 3900 aattaggaaa agcaggatat gtaactgaca gaggaagaca aaaagttgtc cccctaacgg 3960 acacaacaaa tcagaagact gagttacaag caattcatct agctttgcag gattcgggat 4020 tagaagtaaa catagtgaca gactcacaat atgcattggg aatcattcaa gcacaaccag 4080 ataagagtga atcagagtta gtcagtcaaa taatagagca gttaataaaa aaggaaaaag 4140 tctacctggc atgggtacca gcacacaaag gaattggagg aaatgaacaa gtagatgggt 4200 tggtcagtgc tggaatcagg aaagtactat ttttagatgg aatagataag gcccaagaag 4260 aacatgagaa atatcacagt aattggagag caatggctag tgattttaac ctaccacctg 4320 tagtagcaaa agaaatagta gccagctgtg ataaatgtca gctaaaaggg gaagccatgc 4380 atggacaagt agactgtagc ccaggaatat ggcagctaga ttgtacacat ttagaaggaa 4440 aagttatctt ggtagcagtt catgtagcca gtggatatat agaagcagaa gtaattccag 4500 cagagacagg gcaagaaaca gcatacttcc tcttaaaatt agcaggaaga tggccagtaa 4560 aaacagtaca tacagacaat ggcagcaatt tcaccagtac tacagttaag gccgcctgtt 4620 ggtgggcggg gatcaagcag gaatttggca ttccctacaa tccccaaagt caaggagtaa 4680 tagaatctat gaataaagaa ttaaagaaaa ttataggaca ggtaagagat caggctgaac 4740 atcttaagac agcagtacaa atggcagtat tcatccacaa ttttaaaaga aaagggggga 4800 ttggggggta cagtgcaggg gaaagaatag tagacataat agcaacagac atacaaacta 4860 aagaattaca aaaacaaatt acaaaaattc aaaattttcg ggtttattac agggacagca 4920 gagatccagt ttggaaagga ccagcaaagc tcctctggaa aggtgaaggg gcagtagtaa 4980 tacaagataa tagtgacata aaagtagtgc caagaagaaa agcaaagatc atcagggatt 5040 atggaaaaca gatggcaggt gatgattgtg tggcaagtag acaggatgag gattaacaca 5100 tggaaaagat tagtaaaaca ccatatgtat atttcaagga aagctaagga ctggttttat 5160 agacatcact atgaaagtac taatccaaaa ataagttcag aagtacacat cccactaggg 5220 gatgctaaat tagtaataac aacatattgg ggtctgcata caggagaaag agactggcat 5280 ttgggtcagg gagtctccat agaatggagg aaaaagagat atagcacaca agtagaccct 5340

gacctagcag accaactaat tcatctgcac tattttgatt gtttttcaga atctgctata 5400 agaaatacca tattaggacg tatagttagt cctaggtgtg aatatcaagc aggacataac 5460 aaggtaggat ctctacagta cttggcacta gcagcattaa taaaaccaaa acagataaag 5520 ccacctttgc ctagtgttag gaaactgaca gaggacagat ggaacaagcc ccagaagacc 5580 aagggccaca gagggagcca tacaatgaat ggacactaga gcttttagag gaacttaaga 5640 gtgaagctgt tagacatttt cctaggatat ggctccataa cttaggacaa catatctatg 5700 aaacttacgg ggatacttgg gcaggagtgg aagccataat aagaattctg caacaactgc 5760 tgtttatcca tttcagaatt gggtgtcgac atagcagaat aggcgttact cgacagagga 5820 gagcaagaaa tggagccagt agatcctaga ctagagccct ggaagcatcc aggaagtcag 5880 cctaaaactg cttgtaccaa ttgctattgt aaaaagtgtt gctttcattg ccaagtttgt 5940 ttcatgacaa aagccttagg catctcctat ggcaggaaga agcggagaca gcgacgaaga 6000 gctcatcaga acagtcagac tcatcaagct tctctatcaa agcagtaagt agtacatgta 6060 atgcaaccta taatagtagc aatagtagca ttagtagtag caataataat agcaatagtt 6120 gtgtggtcca tagtaatcat agaatatagg aaaatattaa gacaaagaaa aatagacagg 6180 ttaattgata gactaataga aagagcagaa gacagtggca atgagagtga aggagaagta 6240 tcagcacttg tggagatggg ggtggaaatg gggcaccatg ctccttggga tattgatgat 6300 ctgtagtgct acagaaaaat tgtgggtcac agtctattat ggggtacctg tgtggaagga 6360 agcaaccacc actctatttt gtgcatcaga tgctaaagca tatgatacag aggtacataa 6420 tgtttgggcc acacatgcct gtgtacccac agaccccaac ccacaagaag tagtattggt 6480 aaatgtgaca gaaaatttta acatgtggaa aaatgacatg gtagaacaga tgcatgagga 6540 tataatcagt ttatgggatc aaagcctaaa gccatgtgta aaattaaccc cactctgtgt 6600 tagtttaaag tgcactgatt tgaagaatga tactaatacc aatagtagta gcgggagaat 6660 gataatggag aaaggagaga taaaaaactg ctctttcaat atcagcacaa gcataagaga 6720 taaggtgcag aaagaatatg cattctttta taaacttgat atagtaccaa tagataatac 6780 cagctatagg ttgataagtt gtaacacctc agtcattaca caggcctgtc caaaggtatc 6840 ctttgagcca attcccatac attattgtgc cccggctggt tttgcgattc taaaatgtaa 6900 taataagacg ttcaatggaa caggaccatg tacaaatgtc agcacagtac aatgtacaca 6960 tggaatcagg ccagtagtat caactcaact gctgttaaat ggcagtctag cagaagaaga 7020 tgtagtaatt agatctgcca atttcacaga caatgctaaa accataatag tacagctgaa 7080 cacatctgta gaaattaatt gtacaagacc caacaacaat acaagaaaaa gtatccgtat 7140 ccagagggga ccagggagag catttgttac aataggaaaa ataggaaata tgagacaagc 7200 acattgtaac attagtagag caaaatggaa tgccacttta aaacagatag ctagcaaatt 7260 aagagaacaa tttggaaata ataaaacaat aatctttaag caatcctcag gaggggaccc 7320 agaaattgta acgcacagtt ttaattgtgg aggggaattt ttctactgta attcaacaca 7380 actgtttaat agtacttggt ttaatagtac ttggagtact gaagggtcaa ataacactga 7440 aggaagtgac acaatcacac tcccatgcag aataaaacaa tttataaaca tgtggcagga .7500 agtaggaaaa gcaatgtatg cccctcccat cagtggacaa attagatgtt catcaaatat 7560 tactgggctg ctattaacaa gagatggtgg taataacaac aatgggtccg agatcttcag 7620 acctggagga ggcgatatga gggacaattg gagaagtgaa ttatataaat ataaagtagt 7680 aaaaattgaa ccattaggag tagcacccac caaggcaaag agaagagtgg tgcagagaga 7740 aaaaagagca gtgggaatag gagctttgtt ccttgggttc ttgggagcag caggaagcac 7800 tatgggctgc acgtcaatga cgctgacggt acaggccaga caattattgt ctgatatagt 7860 gcagcagcag aacaatttgc tgagggctat tgaggcgcaa cagcatctgt tgcaactcac 7920 agtctggggc atcaaacagc tccaggcaag aatcctggct gtggaaagat acctaaagga 7980 tcaacagctc ctggggattt ggggttgctc tggaaaactc atttgcacca ctgctgtgcc 8040 ttggaatgct agttggagta ataaatctct ggaacagatt tggaataaca tgacctggat 8100 ggagtgggac agagaaatta acaattacac aagcttaata cactccttaa ttgaagaatc 8160 gcaaaaccag caagaaaaga atgaacaaga attattggaa ttagataaat gggcaagttt 8220 gtggaattgg tttaacataa caaattggct gtggtatata aaattattca taatgatagt 8280 aggaggettg gtaggtttaa gaatagtttt tgetgtaett tetatagtga atagagttag 8340 gcagggatat tcaccattat cgtttcagac ccacctccca atcccgaggg gacccgacag 8400 gcccgaagga atagaagaag aaggtggaga gagagacaga gacagatcca ttcgattagt 8460 gaacggatcc ttagcactta tctgggacga tctgcggagc ctgtgcctct tcagctacca 8520 ccgcttgaga gacttactct tgattgtaac gaggattgtg gaacttctgg gacgcagggg 8580 gtgggaagcc ctcaaatatt ggtggaatct cctacagtat tggagtcagg aactaaagaa 8640 tagtgctgtt aacttgctca atgccacagc catagcagta gctgagggga cagatagggt 8700 tatagaagta ttacaagcag cttatagagc tattcgccac atacctagaa gaataagaca 8760

gggcttggaa aggattttgc tataagatgg gtggcaagtg gtcaaaaagt agtgtgattg 8820 gatggcctgc tgtaagggaa agaatgagac gagctgagcc agcagcagat ggggtgggag 8880 cagtatctcg agacctagaa aaacatggag caatcacaag tagcaataca gcagctaaca 8940 atgctgcttg tgcctggcta gaagcacaag aggaggaaga ggtgggtttt ccagtcacac 9000 ctcaggtacc tttaagacca atgacttaca aggcagctgt agatcttagc cactttttaa 9060 aagaaaaggg gggactggaa gggctaattc actcccaaag aagacaagat atccttgatc 9120 tgtggatcta ccacacaca ggctacttcc ctgattggca gaactacaca ccagggccag 9180 gggtcagata tccactgacc tttggatggt gctacaagct agtaccagtt gagccagata 9240 aggtagaaga ggccaataaa ggagagaaca ccagcttgtt acaccctgtg agcctgcatg 9300 qaatqqatqa ccctgagaga gaagtgttag agtggaggtt tgacagccgc ctagcatttc 9360 atcacgtggc ccgagagctg catccggagt acttcaagaa ctgctgacat cgagcttgct 9420 acaagggact ttccgctggg gactttccag ggaggcgtgg cctgggcggg actggggagt 9480 ggcgagccct cagatgctgc atataagcag ctgctttttg cctgtactgg gtctctctgg 9540 ttagaccaga tctgagcctg ggagctctct ggctaactag ggaacccact gcttaagcct 9600 caataaagct tgccttgagt gcttcaagta gtgtgtgccc gtctgttgtg tgactctggt 9660 aactagagat ccctcagacc cttttagtca gtgtggaaaa tctctagca

```
<210> 2
<211> 854
<212> PRT
<213> Human immunodeficiency virus
<220>
<223> Envelope Polyprotein
<400> 2
Met Arg Val Lys Glu Lys Tyr Gln His Leu Trp Arg Trp Gly Trp Lys
Trp Gly Thr Met Leu Leu Gly Ile Leu Met Ile Cys Ser Ala Thr Glu
Lys Leu Trp Val Thr Val Tyr Tyr Gly Val Pro Val Trp Lys Glu Ala
                              40
Thr Thr Thr Leu Phe Cys Ala Ser Asp Ala Lys Ala Tyr Asp Thr Glu
                         55
Val His Asn Val Trp Ala Thr His Ala Cys Val Pro Thr Asp Pro Asn
                     70
                                          75
 65
Pro Gln Glu Val Val Leu Val Asn Val Thr Glu Asn Phe Asn Met Trp
                                     90
Lys Asn Asp Met Val Glu Gln Met His Glu Asp Ile Ile Ser Leu Trp
                                 105
                                                     110
Asp Gln Ser Leu Lys Pro Cys Val Lys Leu Thr Pro Leu Cys Val Ser
                            120
                                                 125
        115
Leu Lys Cys Thr Asp Leu Lys Asn Asp Thr Asn Thr Asn Ser Ser Ser
                                             140
                        135
Gly Arg Met Ile Met Glu Lys Gly Glu Ile Lys Asn Cys Ser Phe Asn
                                                             160
                    150
                                         155
145
```

Ile Ser Thr Ser Ile Arg Asp Lys Val Gln Lys Glu Tyr Ala Phe Phe 170 165 Tyr Lys Leu Asp Ile Val Pro Ile Asp Asn Thr Ser Tyr Arg Leu Ile 185 Ser Cys Asn Thr Ser Val Ile Thr Gln Ala Cys Pro Lys Val Ser Phe 195 Glu Pro Ile Pro Ile His Tyr Cys Ala Pro Ala Gly Phe Ala Ile Leu Lys Cys Asn Asn Lys Thr Phe Asn Gly Thr Gly Pro Cys Thr Asn Val Ser Thr Val Gln Cys Thr His Gly Ile Arg Pro Val Val Ser Thr Gln Leu Leu Leu Asn Gly Ser Leu Ala Glu Glu Asp Val Val Ile Arg Ser Ala Asn Phe Thr Asp Asn Ala Lys Thr Ile Ile Val Gln Leu Asn Thr 280 285 Ser Val Glu Ile Asn Cys Thr Arg Pro Asn Asn Asn Thr Arg Lys Ser 295 Ile Arg Ile Gln Arg Gly Pro Gly Arg Ala Phe Val Thr Ile Gly Lys 310 315 305 Ile Gly Asn Met Arg Gln Ala His Cys Asn Ile Ser Arg Ala Lys Trp 330 325 Asn Ala Thr Leu Lys Gln Ile Ala Ser Lys Leu Arg Glu Gln Phe Gly 345 Asn Asn Lys Thr Ile Ile Phe Lys Gln Ser Ser Gly Gly Asp Pro Glu 360 355 Ile Val Thr His Ser Phe Asn Cys Gly Glu Phe Phe Tyr Cys Asn 375 Ser Thr Gln Leu Phe Asn Ser Thr Trp Phe Asn Ser Thr Trp Ser Thr 390 395 385 Glu Gly Ser Asn Asn Thr Glu Gly Ser Asp Thr Ile Thr Leu Pro Cys 410 405 Arg Ile Lys Gln Phe Ile Asn Met Trp Gln Glu Val Gly Lys Ala Met 425 Tyr Ala Pro Pro Ile Ser Gly Gln Ile Arg Cys Ser Ser Asn Ile Thr 445 440 435

Gly Leu Leu Thr Arg Asp Gly Gly Asn Asn Asn Gly Ser Glu

	450					455					460				
Ile 465	Phe	Arg	Pro	Gly	Gly 470	Gly	Asp	Met	Arg	Asp 475	Asn	Trp	Arg	Ser	Glu 480
Leu	Tyr	Lys	Tyr	Lys 485	Val	Val	Lys	Ile	Glu 490	Pro	Leu	Gly	Val	Ala 495	Pro
Thr	Lys	Ala	Lys 500	Arg	Arg	Val	Val	Gln 505	Arg	Glu	Lys	Arg	Ala 510	Val	Gly
Ile	Gly	Ala 515	Leu	Phe	Leu	Gly	Phe 520	Leu	Gly	Ala	Ala	Gly 525	Ser	Thr	Met
Gly	Cys 530	Thr	Ser	Met	Thr	Leu 535	Thr	Val	Gln	Ala	Arg 540	Gln	Leu	Leu	Ser
Asp 545	Ile	Val	Gln	Gln	Gln 550	Asn	Asn	Leu	Leu	Arg 555	Ala	Ile	Glu	Ala	Gln 560
Gln	His	Leu	Leu	Gln 565	Leu	Thr	Val	Trp	Gly 570	Ile	Lys	Gln	Leu	Gln 575	Ala
Arg	Ile	Leu	Ala 580	Val	Glu	Arg	Tyr	Leu 585	Lys	Asp	Gln	Gln	Leu 590	Leu	Gly
Ile	Trp	Gly 595	Cys	Ser	Gly	Lys	Leu 600	Ile	Cys	Thr	Thr	Ala 605	Val	Pro	Trp
Asn	Ala 610	Ser	Trp	Ser	Asn	Lys 615	Ser	Leu	Glu	Gln	Ile 620	Trp	Asn	Asn	Met
Thr 625	Trp	Met	Glu	Trp	Asp 630	Arg	Glu	Ile	Asn	Asn 635	Tyr	Thr	Ser	Leu	Ile 640
His	Ser	Leu	.Ile	Glu 645	Glu	Ser	Gln	Asn	Gln 650	Gln	Glu	Lys	Asn	Glu 655	Gln
Glu	Leu	Leu	Glu 660	Leu	Asp	Lys	Trp	Ala 665	Ser	Leu	Trp	Asn	Trp 670	Phe	Asn
Ile	Thr	Asn 675	Trp	Leu	Trp	Tyr	Ile 680	Lys	Leu	Phe	Ile	Met 685	Ile	Val	Gly
Gly	Leu 690	Val	Gly	Leu	Arg	Ile 695	Val	Phe	Ala	Val	Leu 700	Ser	Ile	Val	Asn
Arg 705	Val	Arg	Gln	Gly	Туг 710	Ser	Pro	Leu	Ser	Phe 715	Gln	Thr	His	Leu	Pro 720
Ile	Pro	Arg	Gly	Pro 725	Asp	Arg	Pro	Glu	Gly 730	Ile	Glu	Glu	Glu	Gly 735	Gly
Glu	Arg	Asp	Arg		Arg	Ser	Ile	Arg 745	Leu	Val	Asn	Gly	Ser 750	Leu	Ala

<222> (97)..(99)

Leu Ile Trp Asp Asp Leu Arg Ser Leu Cys Leu Phe Ser Tyr His Arg 760 Leu Arg Asp Leu Leu Leu Ile Val Thr Arg Ile Val Glu Leu Leu Gly 780 775 Arg Arg Gly Trp Glu Ala Leu Lys Tyr Trp Trp Asn Leu Leu Gln Tyr 790 795 Trp Ser Gln Glu Leu Lys Asn Ser Ala Val Asn Leu Leu Asn Ala Thr 810 815 805 Ala Ile Ala Val Ala Glu Gly Thr Asp Arg Val Ile Glu Val Leu Gln 825 820 Ala Ala Tyr Arg Ala Ile Arg His Ile Pro Arg Arg Ile Arg Gln Gly 840 845 Leu Glu Arg Ile Leu Leu 850 <210> 3 <211> 107 <212> DNA <213> Artificial Sequence <220> <223> Description of the artificial sequence: oligonucleotide for cloning <400> 3 aagatgtagt aattagatct gccaatttca cagacaatgc taaaaccata atagtacagc 60 tgaacacatc gttagaaatt aattgtacaa gacccaacaa caataca <210> 4 <211> 120 <212> DNA <213> Artificial Sequence <220> <223> Description of the artificial sequence: oligonucleotide for cloning <220> <221> misc\_feature

base at position 97 can be G or A, base at position 98 can be A or T, and base at position 99 can be G, A, T or C.

<223> Sequence at this position: (GA)(AT)(GATC), ie.

<400> 4 ttttgctcta gaaatgttac aatgtgcttg tcttatgtct cctgttgcag cttctgttgc 60 atgaaatgct ctccctggtc cgatatggat actatgrwnt tttcttgtat tgttgttggg 120

	<210> <211> <212> <213>	17	
		Description of the artificial sequence: sequencing primer	
	<400> ccatgt	5 acaa atgtcag	17
	<210><211><211><212><213>	17	
		Description of the artificial sequence: sequencing primer	
KD was by Km. 1	<400> aaaact	6 gtgc gttacaa	17
e com	<210><211><212><212><213>	17	
THE T		Description of the artificial sequence: sequencing primer	
	<400> gtaaaa	7 acgac ggccagt	17
	<210><211><211><212><213>	17	
		Description of the artificial sequence: sequencing primer	
	<400> caggaa	8 acag ctatgac	17
	<210> <211>		

```
<212> DNA
<213> Artificial Sequence
<220>
<223> Description of the artificial sequence: synthetic DNA
<220>
<221> misc_feature
<222> (3)..(9)
<223> BstEII cleavage site
<220>
<221> misc_feature
<222> (2143)..(2148)
<223> BamHI cleavage site
<400> 9
tgggtcaccg tctattatgg ggtgcctgtg tggaaggaag caaccaccac tctattttgt 60
gcatcagatg ctaaagcata tgatacagag gtacataatg tttgggccac acatgcctgt 120
gtacccacag accccaaccc acaagaagta gtattggtaa atgtgacaga aaattttaac 180
atgtggaaaa atgacatggt agaacagatg catgaggata taatcagttt atgggatcaa 240
agccttaagc catgtgtaaa attaacccca ctctgtgtta gtttaaagtg cactgatttg 300
aagaatgata ctaataccaa tagtagtagc gggagaatga taatggagaa aggagagata 360
aaaaactgca gcttcaatat cagcacaagc ataagagata aggtgcagaa agaatatgca 420
ttcttttata aacttgatat agtaccaata gataatacca gctataggtt gataagttgt 480
aacacctcag tgatcacaca ggcctgtcca aaggtatcct ttgagccaat tcccatacat 540
tattgtgccc cggctggttt tgcgattcta aaatgtaata ataagacgtt caatggaaca 600
ggaccatgta caaatgtcag cacagtacaa tgtacacatg gaattcgacc agtagtatca 660
actcaactgc tgttaaatgg cagtctagca gaagaagatg tagtaattag atctgccaat 720
ttcacagaca atgctaaaac cataatagta cagctgaaca catctgtaga aattaattgt 780
acaagaccca acaacaatac aagaaaaagt atccgtatcc agaggggacc agggagagca 840
tttgttacaa taggaaaaat aggaaatatg agacaagcac attgtaacat ttctagagca 900
aaatggaatg ccactttaaa acagatagct agcaaattaa gagaacaatt tggaaataat 960
aaaacaataa totttaagca gtoatoogga ggggacocag aaattgtaac gcacagtttt 1020
aattgtggag gggaattttt ctactgtaat tcaacacaac tgtttaatag tacttggttt 1080
aatagtactt ggagtactga agggtcaaat aacactgaag gaagtgacac aatcacactc 1140
ccatgcagaa taaaacaatt tataaacatg tggcaggaag taggaaaagc aatgtatgcc 1200
cctcccatca gtggccaaat tagatgttca tcaaatatta ctgggctgct attaactcga 1260
gatggtggta ataacaacaa tgggtccgag attttcagac ctggaggagg cgatatgagg 1320
gataattgga gaagtgaatt atataaatat aaagtagtaa aaattgaacc attaggagta 1380
gcacccacca aggcaaagag acgcgtggtg cagagagaaa agcgcgcagt gggaatagga 1440
gctctgttcc ttgggttctt gggagcagca ggaagcacta tgggcgcagc gtcaatgacg 1500
ctgacggtac aggccagaca attattgtct gatatagtgc agcagcagaa caatttgctg 1560
agggcaattg aggcgcaaca gcatctgttg caactcacag tctggggcat caaacagctc 1620
caggcaagaa tcctggctgt ggaaagatac ctaaaggatc aacagctcct ggggatttgg 1680
qqttqctctg gaaaactcat ttgcaccact gctgtgcctt ggaatgctag ttggagtaat 1740
aaatctctgg aacagatttg gaataacatg acctggatgg agtgggacag agaaattaac 1800
aattacacaa gcttaataca ctccttaatt gaagaatcgc aaaaccagca agaaaagaat 1860
aattggctgt ggtatataaa attattcata atgatagtag gaggcttggt aggtttaaga 1980
atagtttttg ctgtactttc tatagtgaat agagttaggc agggatattc accattatcg 2040
tttcagaccc acctcccaat cccgagggga cccgacaggc ccgaaggaat agaagaagaa 2100
                                                                 2148
ggtggagaga gagacagaga cagatccatt cgattagtga acggatcc
```

```
<212> DNA
    <213> Artificial Sequence
    <220>
    <223> Description of the artificial sequence: synthetic DNA
    <220>
    <221> sig_peptide
    <222> (1293)..(1295)
    <223> env ATG
    <220>
    <221> misc_feature
    <222> (1377)..(1379)
    <223> env AGT, gp120 start
    <220>
    <221> misc_feature
    <222> (1397)..(1403)
    <223> BstEII cleavage site
    <220>
    <221> misc_feature
    <222> (3537)..(3542)
    <223> BamHI cleavage site
    <220>
    <221> misc_feature
    <222> (3855)..(3857)
    <223> env TAA, stop
    <400> 10
    ctgacgcgcc ctgtagcggc gcattaagcg cggcgggtgt ggtggttacg cgcagcgtga 60
    ccgctacact tgccagcgcc ctagcgcccg ctcctttcgc tttcttccct tcctttctcg 120
    ccacgttcgc cggctttccc cgtcaagctc taaatcgggg gctcccttta gggttccgat 180
12
    ttagtgcttt acggcacctc gaccccaaaa aacttgatta gggtgatggt tcacgtagtg 240
    ggccatcgcc ctgatagacg gtttttcgcc ctttgacgtt ggagtccacg ttctttaata 300
    gtggactett gttccaaact ggaacaacac tcaaccetat ctcggtctat tcttttgatt 360
    tataagggat tttgccgatt tcggcctatt ggttaaaaaa tgagctgatt taacaaaaat 420
    ttaacgcgaa ttttaacaaa atattaacgc ttacaatttc cattcgccat tcaggctgcg 480
    caactgttgg gaagggcgat cggtgcgggc ctcttcgcta ttacgccagc tggcgaaagg 540
    gggatgtgct gcaaggcgat taagttgggt aacgccaggg ttttcccagt cacgacgttg 600
    taaaacgacg gccagtgagc gtctagttat taatagtaat caattacggg gtcattagtt 660
    catageceat atatggagtt cegegttaca taacttaegg taaatggeee geetggetga 720
    ccgcccaacg accccgccc attgacgtca ataatgacgt atgttcccat agtaacgcca 780
    atagggactt tccattgacg tcaatgggtg gagtatttac ggtaaactgc ccacttggca 840
    gtacatcaag tgtatcatat gccaagtacg cccctattg acgtcaatga cggtaaatgg 900
    cccgcctggc attatgccca gtacatgacc ttatgggact ttcctacttg gcagtacatc 960
    tacgtattag tcatcgctat taccatggtg atgcggtttt ggcagtacat caatgggcgt 1020
    ggatageggt ttgactcacg gggatttcca agtetecace ceattgaegt caatgggagt 1080
    ttgttttggc accaaaatca acgggacttt ccaaaatgtc gtaacaactc cgccccattg 1140
    acgcaaatgg gcggtaggcg tgtacggtgg gaggtctata taagcagagc tcgtttagtg 1200
    aaccgtcaga tcgcctggag acgccatcca cgctgttttg acctccatag aagacaccgg 1260
    gacaattcga gctcggtacc gtcgacgcca ccatgagagt gaaggagaag tatcagcact 1320
    tgtggagatg ggggtggaaa tggggcacca tgctccttgg gatattgatg atctgtagtg 1380
    ctacagaaaa attgtgggtc accgtctatt atggggtacc tgtgtggaag gaagcaacca 1440
    ccactctatt ttgtgcatca gatgctaaag catatgatac agaggtacat aatgtttggg 1500
```

ccacacatgc ctgtgtaccc acagacccca acccacaaga agtagtattg gtaaatgtga 1560 cagaaaattt taacatgtgg aaaaatgaca tggtagaaca gatgcatgag gatataatca 1620 gtttatggga tcaaagccta aagccatgtg taaaattaac cccactctgt gttagtttaa 1680 agtgcactga tttgaagaat gatactaata ccaatagtag tagcgggaga atgataatgg 1740 agaaaggaga gataaaaaac tgctctttca atatcagcac aagcataaga gataaggtgc 1800 agaaagaata tgcattcttt tataaacttg atatagtacc aatagataat accagctata 1860 ggttgataag ttgtaacacc tcagtcatta cacaggcctg tccaaaggta tcctttgagc 1920 caattcccat acattattgt gccccggctg gttttgcgat tctaaaatgt aataataaga 1980 cgttcaatgg aacaggacca tgtacaaatg tcagcacagt acaatgtaca catggaatca 2040 ggccagtagt atcaactcaa ctgctgttaa atggcagtct agcagaagaa gatgtagtaa 2100 ttagatctgc caatttcaca gacaatgcta aaaccataat agtacagctg aacacatctg 2160 tagaaattaa ttgtacaaga cccaacaaca atacaagaaa aagtatccgt atccagaggg 2220 gaccagggag agcatttgtt acaataggaa aaataggaaa tatgagacaa gcacattgta 2280 acattagtag agcaaaatgg aatgccactt taaaacagat agctagcaaa ttaagagaac 2340 aatttggaaa taataaaaca ataatcttta agcaatcctc aggaggggac ccagaaattg 2400 taacgcacag ttttaattgt ggaggggaat ttttctactg taattcaaca caactgttta 2460 atagtacttg gtttaatagt acttggagta ctgaagggtc aaataacact gaaggaagtg 2520 acacaatcac actcccatgc agaataaaac aatttataaa catgtggcag gaagtaggaa 2580 aagcaatgta tgcccctccc atcagtggac aaattagatg ttcatcaaat attactgggc 2640 tgctattaac aagagatggt ggtaataaca acaatgggtc cgagatcttc agacctggag 2700 gaggcgatat gagggacaat tggagaagtg aattatataa atataaagta gtaaaaattg 2760 aaccattagg agtagcaccc accaaggcaa agagaagagt ggtgcagaga gaaaaaagag 2820 cagtgggaat aggagctttg ttccttgggt tcttgggagc agcaggaagc actatgggct 2880 gcacgtcaat gacgctgacg gtacaggcca gacaattatt gtctgatata gtgcagcagc 2940 agaacaattt gctgagggct attgaggcgc aacagcatct gttgcaactc acagtctggg 3000 gcatcaaaca gctccaggca agaatcctgg ctgtggaaag atacctaaag gatcaacagc 3060 tcctggggat ttggggttgc tctggaaaac tcatttgcac cactgctgtg ccttggaatg 3120 ctagttggag taataaatct ctggaacaga tttggaataa catgacctgg atggagtggg 3180 acagagaaat taacaattac acaagcttaa tacactcctt aattgaagaa tcgcaaaacc 3240 agcaagaaaa gaatgaacaa gaattattgg aattagataa atgggcaagt ttgtggaatt 3300 ggtttaacat aacaaattgg ctgtggtata taaaattatt cataatgata gtaggaggct 3360 tggtaggttt aagaatagtt tttgctgtac tttctatagt gaatagagtt aggcagggat 3420 attcaccatt atcgtttcag acccacctcc caatcccgag gggacccgac aggcccgaag 3480 gaatagaaga agaaggtgga gagagagaca gagacagatc cattcgatta gtgaacggat 3540 ccttagcact tatctgggac gatctgcgga gcctgtgcct cttcagctac caccgcttga 3600 gagacttact cttgattgta acgaggattg tggaacttct gggacgcagg gggtgggaag 3660 ccctcaaata ttggtggaat ctcctacagt attggagtca ggaactaaag aatagtgctg 3720 ttaacttgct caatgccaca gccatagcag tagctgaggg gacagatagg gttatagaag 3780 tattacaagc agcttataga gctattcgcc acatacctag aagaataaga cagggcttgg 3840 aaaggatttt gctataagat gggtggcaag tggtcaaaaa gtagtgtgat tggatggcct 3900 gctgtaaggg aaagaatgag acgagctgag ccagcagcag atggggtggg agcagtatct 3960 cgagatctag actagaacta gcttcgatcc agacatgata agatacattg atgagtttgg 4020 acaaaccaca actagaatgc agtgaaaaaa atgctttatt tgtgaaattt gtgatgctat 4080 tgctttattt gtaaccatta taagctgcaa taaacaagtt aacaacaaca attgcattca 4140 ttttatgttt caggttcagg gggaggtgtg ggaggttttt taaagcaagt aaaacctcta 4200 caaatqtqqt atqqctqatt atgatcctgc ctcgcgcgtt tcggtgatga cggtgaaaac 4260 ctctgacaca tgcagctccc ggagacggtc acagcttgtc tgtaagcgga tgccgggagc 4320 agacaagccc gtcagggcgc gtcagcgggt gttggcgggt gtcggggcgc agccatgacc 4380 cagtcacgta gcgatagcgg agtgtatact ggcttaacta tgcggcatca gagcagattg 4440 tactgagagt gcaccatatg tcgggccgcg ttgctggcgt ttttccatag gctccgcccc 4500 cctgacgagc atcacaaaaa tcgacgctca agtcagaggt ggcgaaaccc gacaggacta 4560 taaagatacc aggcgtttcc ccctggaagc tccctcgtgc gctctcctgt tccgaccctg 4620 ccgcttaccg gatacctgtc cgcctttctc ccttcgggaa gcgtggcgct ttctcatagc 4680 tcacgctgta ggtatctcag ttcggtgtag gtcgttcgct ccaagctggg ctgtgtgcac 4740 gaaccccccg ttcagcccga ccgctgcgcc ttatccggta actatcgtct tgagtccaac 4800 ccggtaagac acgacttatc gccactggca gcagccactg gtaacaggat tagcagagcg 4860 aggtatgtag gcggtgctac agagttcttg aagtggtggc ctaactacgg ctacactaga 4920

```
aggacagtat ttggtatctg cgctctgctg aagccagtta ccttcggaaa aagagttggt 4980
agctcttgat ccggcaaaca aaccaccgct ggtagcggtg gtttttttgt ttgcaagcag 5040
cagattacgc gcagaaaaaa aggatctcaa gaagatcctt tgatcttttc tacggggtct 5100
gacgctcagt ggaacgaaaa ctcacgttaa gggattttgg tcatgagatt atcaaaaagg 5160
atcttcacct agatcctttt aaattaaaaa tgaagtttta aatcaatcta aagtatatat 5220
gagtaaactt ggtctgacag ttaccaatgc ttaatcagtg aggcacctat ctcagcgatc 5280
tgtctatttc gttcatccat agttgcctga ctccccgtcg tgtagataac tacgatacgg 5340
gagggcttac catctggccc cagtgctgca atgataccgc gagacccacg ctcaccggct 5400
ccagatttat cagcaataaa ccagccagcc ggaagggccg agcgcagaag tggtcctgca 5460
actttatccg cctccatcca gtctattaat tgttgccggg aagctagagt aagtagttcg 5520
ccagttaata gtttgcgcaa cgttgttgcc attgctacag gcatcgtggt gtcacgctcg 5580
tcgtttggta tggcttcatt cagctccggt tcccaacgat caaggcgagt tacatgatcc 5640
cccatgttgt gcaaaaaagc ggttagctcc ttcggtcctc cgatcgttgt cagaagtaag 5700
ttggccgcag tgttatcact catggttatg gcagcactgc ataattctct tactgtcatg 5760
ccatccgtaa gatgcttttc tgtgactggt gagtactcaa ccaagtcatt ctgagaatag 5820
tgtatgegge gaccgagttg ctcttgeeeg gegteaatae gggataatae egegeeacat 5880
agcagaactt taaaagtgct catcattgga aaacgttctt cggggcgaaa actctcaagg 5940
atcttaccgc tgttgagatc cagttcgatg taacccactc gtgcacccaa ctgatcttca 6000
gcatctttta ctttcaccag cgtttctggg tgagcaaaaa caggaaggca aaatgccgca 6060
aaaaagggaa taagggcgac acggaaatgt tgaatactca tactcttcct ttttcaatat 6120
tattgaagca tttatcaggg ttattgtctc atgagcggat acatatttga atgtatttag 6180
                                                                  6229
aaaaataaac aaataggggt tccgcgcaca tttccccgaa aagtgccac
<210> 11
<211> 860
<212> DNA
<213> Human immunodeficiency virus
<220>
<221> misc_feature
<222> (1)..(860)
<223> PI-932 original sequence V1-V2-V3-loop
<400> 11
tgtgtaccca cagaccccaa cccacaaaag gtagtattgg aaaatgtgac agaaaatttt 60
aacatgtgga aaaatgacat ggtagaacag atgcatgagg atataatcaa tttatgggat 120
caaagcctaa agccatgtgt aaaactaacc ccactctgtg ttactttaaa ttgcactgat 180
gctgatttaa attgcaataa tactgattta aattgcacta aagctaattt ggggaaaaat 240
actcataaca atactattag tgggaaaata atagagaaag tagaaataaa aaactgctct 300
ttcaaggtca ccacaggcat aagggataag atgcaaaaag aatatgcact tttgaataaa 360
cttgatatag taccaataga taatgataag aataatacta actttatatt gataagttgt 420
aacacctcga ccattacaca ggcctgtcca aaggtatcct ttgagccaat tcccatacat 480
ttttgtgccc cggctggttt tgcgattcta aagtgtaatg aaaagagtta cagtggaaaa 540
ggaccatgta aaaatgtcag cacagtacaa tgtacacatg gaattaggcc agtagtgtca 600
actcaactgc tgttgaatgg cagtctagca gaaaaagaag tagtaattag atctgagaat 660
ttcacagaca atgctaaaac cataatagta cagctgaagg aatctgtaaa cattacttgt 720
ataagacccc acaacactgt aacagacagg atacatatag ggccagggag atcatttcat 780
acaacaagaa aaataaaagg agatataaga caagcacatt gtagccttag gagaaaagat 840
                                                                  860
tggaataaca ctttacaaga
<210> 12
```

```
<210> 12
<211> 870
<212> DNA
<213> Artificial Sequence
```

<220>
<223> Description of the artificial sequence: PI-932
gene cassette, comprising the cleavage sites for
restriction enzymes BspT1, PstI, BclI, EcoRI,
BglII, PvuII, XbaII, NheI

<400> 12

tgtgtaccca cagaccccaa cccacaaaag gtagtattgg aaaatgtgac agaaaatttt 60 aacatgtgga aaaatgacat ggtagaacag atgcatgagg atataatcaa tttatgggat 120 caaagcctta agccatgtgt aaaactaacc ccactctgtg ttactttaaa ttgcactgat 180 gctgatttaa attgcaataa tactgattta aattgcacta aagctaattt ggggaaaaat 240 actcataact gcagtattag tgggaaaata atagagaaag tagaaataaa aaactgctct 300 ttcaaggtca ccacaggcat aagggataag atgcaaaaag aatatgcact tttgaataaa 360 cttgatatag taccaataga taatgataag aataatacta actttatatt gataagttgt 420 aacacctcgg tgatcacaca ggcctgtcca aaggtatcct ttgagccaat tcccatacat 480 ttttgtgccc cggctggttt tgcgattcta aagtgtaatg aaaagagtta cagtggaaaa 540 ggaccatgta aaaatgtcag cacagtacaa tgtacacatg gaattcggcc agtagtgtca 600 actcaactgc tgttgaatgg cagtctagca gaaaaagaag tagtaattag atctgagaat 660 ttcacagaca atgctaaaac cataatagta cagctgaagg aatctgtaaa cattacttgt 720 ataagacccc acaacactgt aacagacagg atacatatag ggccagggag atcatttcat 780 acaacaagaa aaataaaagg agatataaga caagcacatt gtagcctttc tagaaaagat 840 870 tqqaataaca ctttacaaga gatagctagc

À.